

**FINANCIAL ASSISTANCE  
FUNDING OPPORTUNITY ANNOUNCEMENT**



**U.S. Department of Energy**

**Office of Science  
Office of Fusion Energy Sciences**

**Theoretical Research in Magnetic Fusion Energy Science**

**Funding Opportunity Number: DE-PS02-08ER08-08**

**Announcement Type: Initial**

**CFDA Number: 81.049**

**ISSUE DATE: January 23, 2008**

**PREAPPLICATION DUE DATE: Not Required**

**LETTER OF INTENT DUE DATE: February 22, 2008**

**APPLICATION DUE DATE: April 1, 2008, 8:00 p.m. Eastern Time**

## NOTE: REQUIREMENTS FOR GRANTS.GOV

**Where to Submit:** Applications must be submitted through Grants.gov to be considered for award. You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately. Remember you have to update your CCR registration annually. If you have any questions about your registration, you should contact the Grants.gov Helpdesk at 1-800-518-4726 to verify that you are still registered in Grants.gov.

**Registration Requirements:** There are several one-time actions you must complete in order to submit an application through Grants.gov (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), register with the credential provider, and register with Grants.gov). See <http://www.grants.gov/GetStarted>. Use the Grants.gov Organization Registration Checklist at <http://www.grants.gov/assets/OrganizationRegCheck.doc> to guide you through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in the CCR registration process. Applicants, who are not registered with CCR and Grants.gov, should allow at **least 21 days** to complete these requirements. It is suggested that the process be started as soon as possible.

**IMPORTANT NOTICE TO POTENTIAL APPLICANTS:** When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

**MICROSOFT VISTA AND OFFICE 2007 COMPATIBILITY:** Grants.gov is currently incompatible with both the new Microsoft (MS) Vista Operating System and the new Microsoft (MS) Office 2007 versions of Word, Excel and Power Point. In order to create and submit your application to Grants.gov, you must find a computer with a previous version Microsoft Operating System, such as Windows XP.

If you attach a file created using MS Office 2007, you will not get an error message when you submit the application, HOWEVER your entire application will not be able to be processed or accepted at Grants.gov and will not reach DOE. Grants.gov can accept applications with attachments created in MS Office 2007 if the attachments are saved in the prior format. See [www.grants.gov/www.grants.gov/assets/Vista\\_and\\_office\\_07\\_Compatibility.pdf](http://www.grants.gov/www.grants.gov/assets/Vista_and_office_07_Compatibility.pdf) for detailed instructions on how to do this. A file created in MS Office 2007 can be identified by the "x" at the end of the file extension, for example "sample.docx" for a Word file.

Contact Grants.gov at 1-800-518-4726 with any questions.

**Questions:** **Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov** at 1-800-518-4726 or [support@grants.gov](mailto:support@grants.gov). Part VII of this announcement explains how to submit other questions to the Department of Energy.

**Application Receipt Notices:** After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the e-mails. It may take up to two (2) business days from application submission to receipt of e-mail Number 2. When the AOR receives e-mail Number

5, it is their responsibility to follow the instructions in the e-mail to logon to IIPS and verify that their application was received by DOE. The titles of the five e-mails are:

Number 1 – Grants.gov Submission Receipt Number

Number 2 – Grants.gov Submission Validation Receipt for Application Number

Number 3 – Grants.gov Grantor Agency Retrieval Receipt for Application Number

Number 4 – Grants.gov Agency Tracking Number Assignment for Application Number

Number 5 – DOE e-Center Grant Application Received

The last e-mail will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last e-mail changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This e-mail will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

## **TABLE OF CONTENTS**

### **PART I – FUNDING OPPORTUNITY DESCRIPTION**

### **PART II – AWARD INFORMATION**

- A. Type of Award Instrument**
- B. Estimated Funding**
- C. Maximum and Minimum Award Size**
- D. Expected Number of Awards**
- E. Anticipated Award Size**
- F. Period of Performance**
- G. Type of Application**

### **PART III – ELIGIBILITY INFORMATION**

- A. Eligible Applicants**
- B. Cost Sharing or Matching**
- C. Other Eligibility Requirements**

### **PART IV – APPLICATION AND SUBMISSION INFORMATION**

- A. Address to Request Application Package**
- B. Letter of Intent and Pre-Application**
- C. Content and Form of Application**
- D. Submissions from Successful Applicants**
- E. Submission Dates and Times**
- F. Intergovernmental Review**
- G. Funding Restrictions**
- H. Other Submission and Registration Requirements**

### **PART V – APPLICATION REVIEW INFORMATION**

- A. Criteria**
- B. Review and Selection Process**
- C. Anticipated Notice of Selection and Award Dates**

### **PART VI – AWARD ADMINISTRATION INFORMATION**

- A. Award Notices**
- B. Administrative and National Policy Requirements**
- C. Reporting**

### **PART VII – QUESTIONS/AGENCY CONTACTS**

- A. Questions**
- B. Agency Contacts**

### **PART VIII – OTHER INFORMATION**

- A. Modifications**
- B. Government Right to Reject or Negotiate**
- C. Commitment of Public Funds**
- D. Proprietary Application Information**
- E. Evaluation and Administration by Non-Federal Personnel**

- F. Intellectual Property Developed under this Program**
- G. Notice of Right to Request Patent Waiver**
- H. Notice Regarding Eligible/Ineligible Activities**

## **PART I – FUNDING OPPORTUNITY DESCRIPTION**

### **GENERAL INQUIRIES ABOUT THIS FOA SHOULD BE DIRECTED TO:**

Dr. Curtis Bolton, Office of Fusion Energy Sciences  
Phone: (301) 903-4914  
E-mail: [curt.bolton@science.doe.gov](mailto:curt.bolton@science.doe.gov)

**SUMMARY:** The Office of Fusion Energy Sciences (OFES) of the Office of Science (SC), U.S. Department of Energy (DOE), hereby announces its interest in receiving grant applications for theoretical research relevant to the U.S. program in magnetic fusion energy sciences. All individuals or groups planning to submit applications for new or renewal funding in Fiscal Year 2009 should submit in response to this Notice.

The specific areas of interest are:

1. Magnetohydrodynamics
2. Confinement and Transport
3. Boundary Physics
4. Plasma Heating, Non-inductive Current Drive, and Energetic Particles
5. Innovative Magnetic Confinement Concepts
6. Atomic and Molecular Processes in Plasmas

More specific information on each area of interest is outlined in the general and program specific supplementary information below.

Due to the limited availability of funds, Principal Investigators with continuing grants may not submit a new application in the same area(s) of interest as their previous application(s), which received funding. A Principal Investigator may submit only one application under each area of interest as listed above.

### **SUPPLEMENTARY INFORMATION:**

**Program Specific Information** (*See Part VII B. for technical contacts for each specific area*)

#### **1. Magnetohydrodynamics:**

Grant applications are solicited for new research or continuation of past efforts in magnetohydrodynamic (MHD) theory and computations. Work in support of tokamaks as well as non-tokamak innovative magnetic confinement configurations will be considered. Current areas of interest include, but are not limited to, equilibrium and stability, extended MHD including two-fluid effects, resistive wall modes, neoclassical tearing modes, and energetic particle effects.

#### **2. Confinement and Transport:**

Applications in this programmatic area should focus on the understanding and control of the collisional and turbulent physical processes that are responsible for the transport of heat, momentum and particles from the core of magnetically confined plasmas. Topics of interest include, but are not limited to, ion and electron thermal transport, large-scale and zonal flow

generation, particle and momentum transport, impurity transport, and theory-based predictive transport modeling including verification and validation (V&V) efforts. Work in support of tokamaks as well as non-tokamak innovative magnetic confinement configurations will be considered. Both analytical and computational approaches are of interest.

### **3. Boundary Physics:**

Applications in this programmatic area should focus on the understanding of the physical processes occurring in the edge region of magnetically confined plasmas. In tokamaks, this region extends from the top of the pedestal to the first wall. Specific areas of interest include, but are not limited to, pedestal formation and characteristics, edge localized modes, collisional and turbulent edge plasma transport, resonant magnetic perturbations, scrape-off layer and divertor physics, plasma-surface effects, and neutral particle transport. Applications for both analytical and computational work will be considered.

### **4. Plasma Heating, Non-inductive Current Drive, and Energetic Particles:**

Applications will be considered for work in the areas of plasma heating, non-inductive current drive, and energetic particle effects. Heating and current drive of plasmas based on radio frequency (RF) methods, neutral beam injection, helicity injection, and plasma injection will be considered. Specific areas of interest include, but are not limited to, the understanding of the physical processes involved in wave propagation and absorption in magnetized plasmas—including wave coupling at the plasma edge, the understanding of how waves affect macroscopic stability and transport in fusion plasmas, the dynamics of unstable modes excited by energetic particles, and the behavior of alpha particle dominated burning plasmas. Applications for both analytical and computational work will be considered.

### **5. Innovative Magnetic Confinement Concepts:**

Grant applications are desired for analytical and computational research on innovative concepts that have the possibility of leading to improved magnetic fusion systems. Increased analytical and computational research is needed to help in the analysis of experimental data and aid in planning innovative fusion related experiments. Concepts of interest include, but are not limited to, compressional heating of magnetized plasmas, field reversed configuration, spheromak, levitated dipole, plasma jets, centrifugal confinement, reversed field pinch, spherical torus, and stellarator.

### **6. Atomic and Molecular Processes in Plasmas:**

Grant applications will be considered for analytical and computational research relevant to the description of atomic processes in plasmas. In addition to overall scientific merit, emphasis will be given to work that promises to aid the understanding of the basic atomic processes that are important for modeling of magnetically confined plasmas. The program has found understanding electron-atom and electron-ion collisions and the radiation emitted by atoms and ions to be of importance for the modeling of plasma behavior in experiments. Some current areas where atomic processes are considered to be important include transport, impurities, plasma-wall interaction, and the understanding of diagnostic methods.

**Collaboration**

Collaborative research projects involving more than one institution, as well as basic theoretical work in support of the OFES Scientific Discovery through Advanced Computing (SciDAC) portfolio, are encouraged. Applications submitted from different institutions, which are directed at a common research activity, should clearly indicate they are part of a proposed collaboration and contain a brief description of the overall research project. However, each application must have a distinct scope of work and a qualified principal investigator who is responsible for the research effort being performed at his or her institution. Synergistic collaborations with researchers in Federally Funded Research and Development Centers (FFRDCs), including the DOE National Laboratories, are also encouraged though no funds will be provided to these organizations under this Notice. Further information on preparation of collaborative applications may be accessed via the Internet at: <http://www.science.doe.gov/grants/Colab.html>.

**Program Funding**

It is anticipated that about \$3,500,000 of Fiscal Year 2009 funding will be available to fund new work, or renewals of existing work, from applications received in response to this Notice. Since future year funding is not anticipated to increase, applications should propose constant effort in future years (allowing for inflation). Future year funding will depend upon suitable progress and the availability of funds. The cost-effectiveness of the application will be considered when comparing applications with differing funding requirements. The number and size of awards will depend on the number of meritorious applications and the availability of appropriated funds. DOE is under no obligation to pay for any costs associated with preparation or submission of applications. DOE reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this Notice.



## **PART II – AWARD INFORMATION**

### **A. TYPE OF AWARD INSTRUMENT.**

DOE anticipates awarding grants under this program announcement.

### **B. ESTIMATED FUNDING.**

It is anticipated that about \$3,500,000 of Fiscal Year 2009 funding will be available to fund new work, or renewals of existing work, from applications received in response to this Notice. Since future year funding is not anticipated to increase, applications should propose constant effort in future years (allowing for inflation). Future year funding will depend upon suitable progress and the availability of funds. The cost-effectiveness of the application will be considered when comparing applications with differing funding requirements. The number and size of awards will depend on the number of meritorious applications and the availability of appropriated funds. DOE is under no obligation to pay for any costs associated with preparation or submission of applications. DOE reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this Notice.

### **C. MAXIMUM AND MINIMUM AWARD SIZE.**

See B. Estimated Funding section above.

### **D. EXPECTED NUMBER OF AWARDS.**

See B. Estimated Funding section above.

### **E. ANTICIPATED AWARD SIZE.**

See B. Estimated Funding section above.

### **F. PERIOD OF PERFORMANCE.**

See B. Estimated Funding section above.

### **G. TYPE OF APPLICATION.**

DOE will accept new and renewal applications under this announcement. Renewal applications compete with all other applications. In preparing a renewal application, applicants should assume that reviewers will not have access to previous applications. The application should be developed as fully as though the applicant were applying for the first time. The application must include all the information required for a new project, plus the project narrative section should discuss the results from prior work.

### **PART III - ELIGIBILITY INFORMATION**

#### **A. ELIGIBLE APPLICANTS.**

All types of applicants are eligible to apply, except other Federal agencies, Federally Funded Research and Development Center (FFRDC) Contractors, and nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995.

Funding under this Notice is limited to supporting research activities based in the U.S., although subcontracts with limited funding for collaborators outside the U.S. may be allowed with appropriate justifications.

#### **B. COST SHARING.**

Cost sharing is not required.

#### **C. OTHER ELIGIBILITY REQUIREMENTS.**

Section 2306 of the Energy Policy Act of 1992 (EPACT) [42 U.S.C. 13525] imposes certain eligibility requirements on awards made under this program. In order to make an award to an applicant that is a business entity, other than a non-profit organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954, DOE must determine that the applicant's participation will be in the economic interest of the United States and that the applicant is either a U.S. owned company or is incorporated or organized under the laws of any State and that its parent company is incorporated or organized under the laws of a country that affords: (1) to U.S. owned companies opportunities comparable to those afforded to any other company to participate in government-supported joint ventures in energy research and development and in local investment opportunities; and (2) adequate and effective protection for intellectual property rights of the U. S. owned companies. Eligible applicants must be able to meet these two tests. (See Section IV.C for submission of EPACT Representation.)

## PART IV – APPLICATION AND SUBMISSION INFORMATION

### A. ADDRESS TO REQUEST APPLICATION PACKAGE.

Application forms and instructions are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select "Apply for Grants", and then select "Download Application Package". Enter the CFDA and/or the funding opportunity number located on the cover of this announcement and then follow the prompts to download the application package.

### B. LETTER OF INTENT AND PREAPPLICATION.

#### 1. Letter of Intent.

A Letter of Intent (LOI) to submit an application is **REQUIRED** and should be submitted by February 22, 2008. **Failure to submit a Letter of Intent by an applicant may preclude the full application from due consideration.** The Letter of Intent should be submitted electronically by E-mail to [John.Sauter@science.doe.gov](mailto:John.Sauter@science.doe.gov) and [Curt.Bolton@science.doe.gov](mailto:Curt.Bolton@science.doe.gov). Please include "Letter of Intent for Notice DE-PS02-08ER08-08" in the subject line.

The purpose of the Letter of Intent (LOI) is to facilitate the OFES in planning the peer review and the selection of potential reviewers for the proposal. For this purpose, the LOI must include a one-page abstract of the proposed research and list the names and institutional affiliations of Principal Investigators, any Co-Principal Investigators, key investigators, collaborators or consultants, so as to identify any potential conflict of interest in the selection of qualified reviewers for the application.

#### 2. Preapplication.

Preapplications are not required.

### C. CONTENT AND FORM OF APPLICATION – SF 424 (R&R)

You must complete the mandatory forms and any applicable optional forms (e.g., SF-LLL-Disclosure of Lobbying Activities) in accordance with the instructions on the forms and the additional instructions below. **Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement.**

#### 1. SF 424 (R&R)

Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. To activate the instructions, turn on the "Help Mode" (Icon with the pointer and question mark at the top of the form). The list of certifications and assurances referenced in Field 18 can be found on the Applicant and Recipient Page at [http://management.energy.gov/business\\_doe/business\\_forms.htm](http://management.energy.gov/business_doe/business_forms.htm), under Certifications and Assurances.

## 2. RESEARCH AND RELATED Other Project Information.

Complete questions 1 through 5 and attach files. The files must comply with the following instructions:

### **Project Summary/Abstract (Field 6 on the Form)**

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). This document must not include any proprietary or sensitive business information as the Department may make it available to the public. The project summary must not exceed 1 page when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) with font not smaller than 11 point. To attach a Project Summary/Abstract, click "Add Attachment."

### **Project Narrative (Field 7 on the form)**

Since we expect that some reviewers will be asked to review several applications, the project narrative should be limited to a **maximum of twenty (20) pages** of technical information, including text and figures, when printed using standard 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) and font not smaller than 11 point. Applications from large groups (those requesting funding of \$1,000,000 per year or more) and whose scope of work includes more than one area of interest should be structured in a way that facilitates separate reviewing. This objective can be accomplished by breaking the *Background and Recent Accomplishments* and *Proposed Research and Tasks* sections of the narrative (as described below) into self-contained parts which can then be assigned to be reviewed by peer-reviewers whose areas of expertise are well-matched to the main focus of each proposed research task. The project narrative for large groups should be limited to 20 pages per area of interest.

The page count of 20 does not include the Face Page and Budget Pages, the Title Page, the biographical material and publication information, or any Appendices. However, it is important that the 20-page technical information section provide a complete description of the proposed work, since reviewers are not obliged to read the Appendices. Applications exceeding these page limits may be rejected without review. **The Abstract, Narrative, and Budget Justification should each be one PDF file attachment.** The PDF file may also include a few selected publications in an Appendix as background information. In addition, in the electronic submission, please limit biographical and publication information for the principal investigator and senior personnel to no more than two pages each. Letters from unfunded collaborators should also be included, if applicable. Please do not submit general letters of support as these are not used in making funding decisions. Each principal investigator should provide an E-mail address. To attach a Project Narrative, click "Add Attachment."

**The first page of your narrative must include the following information (this page will not count in the project narrative page limitation):**

**Applicant/Institution:**  
**Street Address/City/State/Zip:**  
**Principal Investigator:**  
**Postal Address:**  
**Telephone Number:**  
**Email:**  
**Funding Opportunity Announcement Number:** DE-PS02-08ER08-08  
**DOE/Office of Science Program Office:**  
**DOE/Office of Science Program Office Technical Contact:**  
**DOE Grant Number (if Renewal or Supplemental Application):**

Is this a Collaboration? If yes, please list ALL Collaborating Institutions/Pis\* and indicate which ones will also be submitting applications. Also indicate the PI who will be the point of contact and coordinator for the combined research activity.

\* Note that collaborating applications must be submitted separately.

**The project narrative must include:**

Executive Summary

Summarize the application in no more than two pages

Background and Recent Accomplishments

- Background – explanation of the importance and relevance of the proposed work
- Recent Accomplishments - this subsection is mandatory for renewal applications and should summarize the proposed work and the actual progress made during the previous funding period.

Proposed Research and Tasks

*In addition to the technical description of the proposed work and tasks, include a discussion of the following:*

- Plans for comparison with experimental measurements where appropriate
- Plans for verification and validation of computer codes where appropriate
- Impact of the proposed research on other fields of science, if appropriate
- Project schedules, milestones and deliverables

Management plan (for groups of large size), including work breakdown structure showing the level of effort for each task

Biographical Sketch Appendix

Provide a biographical sketch for the project director/principal investigator (PD/PI) and each senior/key person listed in Section A on the R&R Budget form. **Provide the biographical sketch information as an appendix to your project narrative. Do not attach a separate file.** The biographical sketch appendix will not count in the project narrative page limitation. The biographical information for each person must

not exceed 2 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point and must include:

*Education and Training.* Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.

*Research and Professional Experience:* Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

*Publications.* Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically.

Patents, copyrights and software systems developed may be provided in addition to or substituted for publications.

*Synergistic Activities.* List no more than 5 professional and scholarly activities related to the effort proposed.

#### Current and Pending Support.

List all current and pending support for each key person. For each organization providing support, show the total award amount for the entire award period (including indirect costs) and the number of person-months per year to be devoted to the project. Provide the Current and Pending Support as an appendix to your project narrative. Do not attach a separate file. The Current and Pending Support Appendix will not count in the project narrative page limitation. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review.

#### Identification of Potential Conflicts of Interest or Bias in Selection of Reviewers.

Provide the following information in this section:

*Collaborators and Co-editors:* List in alphabetical order all persons, including their current organizational affiliation, who are, or who have been, collaborators or co-authors with you on a research project, book or book article, report, abstract, or paper during the 48 months preceding the submission of this application. Also, list any individuals who are currently, or have been, co-editors with you on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding the submission of this application. If there are no collaborators or co-editors to report, state "None."

*Graduate and Postdoctoral Advisors and Advisees:* List the names and current organizational affiliations of your graduate advisor(s) and principal postdoctoral sponsor(s) during the last 5 years. Also, list the names and current organizational affiliations of your graduate students and postdoctoral associates during the past 5 years.

### **Bibliography & References Cited (Field 8 on the form)**

Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application. **In order to reduce the number of files attached to your application, please provide the Bibliography and References Cited information as an appendix to your project narrative. Do not attach a file in field 8.** This appendix will not count in the project narrative page limitation.

### **Facilities & Other Resources (Field 9 on the form)**

This information is used to assess the capability of the organizational resources, including subawardee resources, available to perform the effort proposed. Identify the facilities to be used (Laboratory, Animal, Computer, Office, Clinical and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. **In order to reduce the number of files attached to your application, please provide the Facility and Other Resource information as an appendix to your project narrative. Do not attach a file in field 9.** This appendix will not count in the project narrative page limitation.

### **Equipment (Field 10 on the form)**

List major items of equipment already available for this project and, if appropriate identify location and pertinent capabilities. **In order to reduce the number of files attached to your application, please provide the Equipment information as an appendix to your project narrative. Do not attach a file in field 10.** This appendix will not count in the project narrative page limitation.

### **Other Attachment (Field 11 on the form)**

If you need to elaborate on your responses to questions 1-5 on the “Other Project Information” document, **provide the information as an appendix to your project narrative. Do not attach a file in field 11.**

## **3. RESEARCH AND RELATED BUDGET.**

Complete the Research and Related Budget form in accordance with the instructions on the form (Activate Help Mode to see instructions) and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the

mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See PART IV, G).

**Budget Justification (Field K on the form).**

Provide the required supporting information for the following costs (See R&R Budget instructions): equipment; domestic and foreign travel; participant/trainees; material and supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. **Attach a single budget justification file for the entire project period in Field K.** The file automatically carries over to each budget year.

**4. R&R SUBAWARD BUDGET ATTACHMENT(S) FORM.**

**Budgets for Subawardees, other than DOE FFRDC Contractors.** You must provide a separate cumulative R&R budget for each subawardee that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total work effort (whichever is less). If you are selected for award, you must submit a multi-year budget for each of these subawardees (See Section IV.D for submission of Subawardees' multi-year budgets). Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET ATTACHMENT(S) FORM and e-mail it to each subawardee that is required to submit a separate budget. Note: Subawardees must have installed PureEdge Viewer before they can complete the form. After the Subawardee has e-mailed its completed budget back to you, attach it to one of the blocks provided on the form. Use up to 10 letters of the subawardee's name (plus.xfd) as the file name (e.g., ucla.xfd or energyres.xfd).

**5. SF-LLL Disclosure of Lobbying Activities** If applicable, complete SF- LLL.

Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying."

**6. EPACT Representation File**

This program is covered under Title XX through XXIII of the Energy Policy Act (EPACT) of 1992 (See Part III. C, Other Eligibility Requirements). If an applicant is a business entity other than an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954, it must provide an EPACT Representation if the amount of Federal funds requested is more than \$100,000. The EPACT Representation form is on the Applicant and Recipient Page at [http://management.energy.gov/business\\_doe/business\\_forms.htm](http://management.energy.gov/business_doe/business_forms.htm). Submission of an electronic application through Grants.gov constitutes the submission of a signed document. The person responsible for providing the representation does not need to sign the document. Type their name in the signature block and save as a pdf file. Do not



submit a scanned copy of the form. Name the file “EPACT.pdf,” and click on “Add Optional Other Attachment” to attach.

State, local, and tribal governments, as well as 501(c)(3) organizations, do not need to complete an EPACT representation form.

### **Summary of Required Forms/Files**

Your application must include the following documents:

<b>Name of Document</b>	<b>Format</b>	<b>Attach to</b>
<b>SF 424 (R&amp;R)</b>	PureEdge Form	N/A
<b>RESEARCH AND RELATED Other Project Information</b>	PureEdge Form	N/A
Project Summary/Abstract	PDF	Field 6
Project Narrative, including required appendices	PDF	Field 7
<b>RESEARCH &amp; RELATED BUDGET</b>	PureEdge Form	N/A
Budget Justification	PDF	Field K

#### **D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS.**

If selected for award, DOE reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information
- Other budget information
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Commitment Letter from Third Parties Contributing to Cost Sharing, if applicable

#### **E. SUBMISSION DATES AND TIMES.**

##### **1. Preapplication Due Date.**

Preapplications are not required.

##### **2. Letter of Intent Due Date.**

A Letter of Intent (LOI) to submit an application is REQUIRED and should be submitted by February 22, 2008. Failure to submit a Letter of Intent by an applicant may preclude the full application from due consideration. The Letter of Intent should be submitted electronically by E-mail to: [John.Sauter@science.doe.gov](mailto:John.Sauter@science.doe.gov) and [Curt.Bolton@science.doe.gov](mailto:Curt.Bolton@science.doe.gov). Please include “Letter of Intent for Notice DE-PS02-

08ER08-08” in the subject line.

### **3. Formal Applications.**

Formal applications submitted in response to this notice must be received by April 1, 2008, 8:00 p.m. Eastern time, to permit timely consideration of awards in Fiscal Year 2009. **You are encouraged to transmit your application well before the deadline.** APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.

## **F. GOVERNMENTAL REVIEW.**

This program is not subject to Executive Order 12372 Intergovernmental Review of Federal Programs.

## **G. FUNDING RESTRICTIONS.**

Cost Principles. Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600.

Pre-award Costs. Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant’s risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

## **H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS**

### **1. Where to Submit.**

**APPLICATIONS MUST BE SUBMITTED THROUGH GRANTS.GOV TO BE CONSIDERED FOR AWARD.** Submit electronic applications through the “Apply for Grants” function at [www.Grants.gov](http://www.Grants.gov). If you have problems completing the registration process or submitting your application, call Grants.gov at 1-800-518-4726 or send an email to [support@grants.gov](mailto:support@grants.gov).

## 2. Registration Process.

You must COMPLETE the one-time registration process (all steps) before you can submit your first application through Grants.gov (See [www.grants.gov/GetStarted](http://www.grants.gov/GetStarted)). **We recommend that you start this process at least three weeks before the application due date.** It may take 21 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at <http://www.grants.gov/assets/OrganizationRegCheck.doc> to guide you through the process. **IMPORTANT:** During the CCR registration process, you will be asked to designate an E-Business Point of Contact (EBIZ POC). The EBIZ POC must obtain a special password called “Marketing Partner identification Number” (MPIN).

When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

## 3. Application Receipt Notices

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the emails. It may take up to two (2) business days from application submission to receipt of email Number 2. You will know that your application has reached DOE when the AOR receives email Number 5. You will need the Submission Receipt Number (email Number 1) to track a submission. The titles of the five e-mails are:

- Number 1 - Grants.gov Submission Receipt Number
- Number 2 - Grants.gov Submission Validation Receipt for Application Number
- Number 3 - Grants.gov Grantor Agency Retrieval Receipt for Application Number
- Number 4 - Grants.gov Agency Tracking Number Assignment for Application Number
- Number 5 – DOE e-Center Grant Application Received

The last email will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last email changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This email will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

## **Part V - APPLICATION REVIEW INFORMATION**

### **A. CRITERIA**

#### **1. Initial Review Criteria.**

Prior to a comprehensive merit evaluation, DOE will perform an initial review in accordance with 10 CFR 605.10(b).

#### **2. Merit Review Criteria**

Applications will be subjected to scientific merit review (peer review) and will be evaluated against the following criteria, listed in descending order of importance as found in 10 CFR Part 605.10 (d), the Office of Science Research Financial Assistance Program. Included with each criterion are the detailed questions that are asked of the reviewers.

##### **1. Scientific and/or technical merit of the project:**

- What important problem(s) in plasma or fusion science does this application address?
- How does the proposed research compare with other research in its field, both in terms of scientific and/or technical merit and originality?
- What is the likelihood that it will lead to new or fundamental advances in its field?
- How adequate are the proposed plans to validate, where appropriate, the theoretical predictions with experimental measurements?

##### **2. Appropriateness of the proposed method or approach:**

- Are the conceptual framework, methods, and analyses adequately developed and likely to lead to scientifically valid conclusions?
- Does the proposed research employ innovative concepts or methods?
- Does the applicant recognize significant potential problems and consider alternative strategies?

##### **3. Competency of the applicant's personnel and adequacy of the proposed resources:**

- How well qualified are the applicant's personnel to carry out the proposed research? (If appropriate, please comment on the scientific reputation and quality of recent research by the principal investigator and other key personnel.)
- Please comment on the applicant's research environment and resources.
- Does the proposed work take advantage of unique facilities and capabilities and/or make good use of collaborative arrangements?

##### **4. Performance under existing award (for renewal applications):**

- Assess the progress the applicants made toward their research goals during the most recent performance period and the impact of the research on the fusion program.
- Have the applicants disseminated the results of their research through publications in peer-reviewed journals, meeting and conference presentations, workshops, or other appropriate means?
- If appropriate, have the applicants attempted to validate their theoretical predictions against experimental results?

## **5. Reasonableness and appropriateness of the proposed budget:**

- Are the proposed budget and staffing levels adequate to carry out the proposed research?

The reviewers are also asked to comment on **Other Appropriate Factors:**

- What are the overall strengths and weaknesses of the application?
- Could the proposed research make a significant contribution to another field?
- If applicable, please comment on the educational benefits of the proposed activity.

Applications from large theory groups will also be rated on the synergy of the group. With respect to synergy, the criteria are:

- Clear evidence of collaborative work.
- The extent to which the group addresses difficult problems requiring a team effort.

The Office of Fusion Energy Sciences shall also consider, as part of the evaluation, other available advice or information as well as program policy factors, such as ensuring an appropriate balance among the program areas and within the program areas, ensuring support for major computational efforts, ensuring support for experiments, and quality of previous performance. The selected projects will be required to acknowledge support by DOE in all public communication of the research results.

## **B. REVIEW AND SELECTION PROCESS.**

### **1. Merit Review.**

Applications that pass the initial review will be subjected to a merit review in accordance with the guidance provided in the “Office of Science Merit Review System for Financial Assistance.” This Merit Review System is available at <http://www.science.doe.gov/grants/merit.html>

### **2. Selection.**

The Selection Official will consider the merit review recommendation, program policy factors, and the amount of funds available.

### **3. Discussions and Award.**

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR part 600 and 605; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

## **C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES.**

It is anticipated that project selection will be completed by September 30, 2008.

## **Part VI - AWARD ADMINISTRATION INFORMATION**

### **A. AWARD NOTICES.**

#### **1. Notice of Selection.**

DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. (See Part IV.G with respect to the allowability of pre-award costs.)

Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

#### **2. Notice of Award.**

A Notice of Financial Assistance Award issued by the contracting officer is the authorizing award document. It normally includes, either as an attachment or by reference: 1. Special Terms and Conditions; 2. Applicable program regulations, if any; 3. Application as approved by DOE; 4. DOE assistance regulations at 10 CFR Part 600, or, for Federal Demonstration Partnership (FDP) institutions, the FDP terms and conditions; 5. National Policy Assurances to Be Incorporated As Award Terms; 6. Budget Summary; and 7. Federal Assistance Reporting Checklist, which identifies the reporting requirements.

### **B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS.**

#### **1. Administrative Requirements.**

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR Part 600 and 10 CFR Part 605 (See: <http://ecfr.gpoaccess.gov>), except for grants made to Federal Demonstration Partnership (FDP) institutions. The FDP terms and conditions and DOE FDP agency specific terms and conditions are located on the National Science Foundation web site at [http://www.nsf.gov/awards/managing/fed\\_dem\\_part.jsp](http://www.nsf.gov/awards/managing/fed_dem_part.jsp).

#### **2. Special Terms and Conditions and National Policy Requirements.**

##### **Special Terms and Conditions and National Policy Requirements.**

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at [http://management.energy.gov/business\\_doe/business\\_forms.htm](http://management.energy.gov/business_doe/business_forms.htm). The National Policy Assurances to Be Incorporated As Award Terms are located at [http://management.energy.gov/business\\_doe/business\\_forms.htm](http://management.energy.gov/business_doe/business_forms.htm).

##### **Intellectual Property Provisions.**

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at [http://www.gc.energy.gov/financial\\_assistance\\_awards.htm](http://www.gc.energy.gov/financial_assistance_awards.htm).

**C. REPORTING.** Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F4600.2, attached to the award agreement.

## **PART VII - QUESTIONS/AGENCY CONTACTS**

### **A. QUESTIONS**

Questions regarding the content of the announcement must be submitted through the “Submit Question” feature of the DOE Industry Interactive Procurement System (IIPS) at <http://e-center.doe.gov>. Locate the program announcement on IIPS and then click on the “Submit Question” button. Enter required information. You will receive an electronic notification that your question has been answered. DOE will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or [support@grants.gov](mailto:support@grants.gov). DOE cannot answer these questions.

Questions regarding the program (technical) requirements should be directed to: Office of Fusion Energy Sciences, SC- 24.2/Germantown Building, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585-1290. Specific contacts for each area of interest, along with telephone numbers and E-mail addresses, are listed below.

### **B. AGENCY CONTACTS:**

Magnetohydrodynamics: Dr. Rostom Dagazian, Research Division, SC-24.2, Telephone (301) 903-4926, or by E-mail: [rostom.dagazian@science.doe.gov](mailto:rostom.dagazian@science.doe.gov)

Confinement and Transport: Dr. John Mandrekas, Research Division, SC-24.2, Telephone (301) 903-0552, or by E-mail: [john.mandrekas@science.doe.gov](mailto:john.mandrekas@science.doe.gov)

Boundary Physics: Dr. Curtis Bolton, Research Division, SC-24.2, Telephone (301) 903-4914, or by E-mail: [curt.bolton@science.doe.gov](mailto:curt.bolton@science.doe.gov)

Plasma Heating, Non-inductive Current Drive, and Energetic Particles: Dr. Rostom Dagazian, Research Division, SC-24.2, Telephone (301) 903-4926, or by E-mail: [rostom.dagazian@science.doe.gov](mailto:rostom.dagazian@science.doe.gov)

Innovative Magnetic Confinement Concepts: Dr. Francis Thio, Research Division, SC-24.2, Telephone (301) 903-4678, or by E-mail: [francis.thio@science.doe.gov](mailto:francis.thio@science.doe.gov); or Dr. Sam Barish, Research Division, SC-24.2, Telephone: (301) 903-2917, or by E-mail: [sam.barish@science.doe.gov](mailto:sam.barish@science.doe.gov).

Atomic and Molecular Processes in Plasmas: Dr. Michael Crisp, Research Division, SC-24.2, Telephone (301) 903-4883, or by E-mail: [michael.crisp@science.doe.gov](mailto:michael.crisp@science.doe.gov).

## **PART VIII - OTHER INFORMATION**

### **A. MODIFICATIONS.**

Notices of any modifications to this announcement will be posted on Grants.gov and the DOE Industry Interactive Procurement System (IIPS). You can receive an email when a modification or an announcement message is posted by joining the mailing list for this announcement through the link in IIPS. When you download the application at Grants.gov, you can also register to receive notifications of changes through Grants.gov.

### **B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE.**

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement and to select any application, in whole or in part, as a basis for negotiation and/or award.

### **C. COMMITMENT OF PUBLIC FUNDS.**

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

### **D. PROPRIETARY APPLICATION INFORMATION.**

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and specifies the pages of the application which are to be restricted:

“The data contained in pages \_\_\_\_\_ of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government’s right to use or disclose data obtained without restriction from any source, including the applicant.”

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

“The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation.”

### **E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL.**

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application.



Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

#### **F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM.**

Patent Rights. The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See “Notice of Right to Request Patent Waiver” in paragraph G below.)

Rights in Technical Data. Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE’s own needs or to insure the commercialization of technology developed under a DOE agreement.

#### **G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER.**

Applicants may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this announcement, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.

Domestic small businesses and domestic nonprofit organizations will receive the patent rights clause at 37 CFR 401.14, i.e., the implementation of the Bayh-Dole Act. This clause permits domestic small business and domestic nonprofit organizations to retain title to subject inventions. Therefore, small businesses and nonprofit organizations do not need to request a waiver.

#### **H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES**

N/A

#### **I. REFERENCE MATERIAL**

N/A